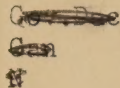



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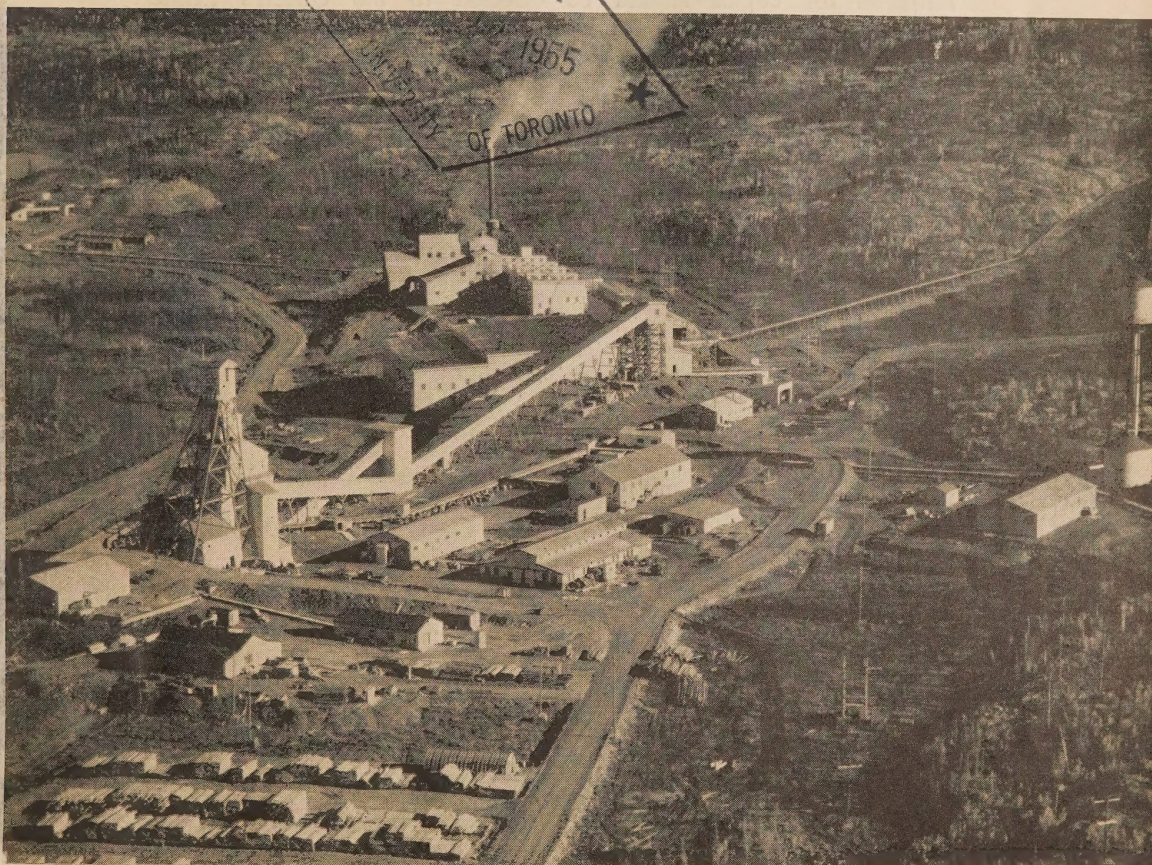
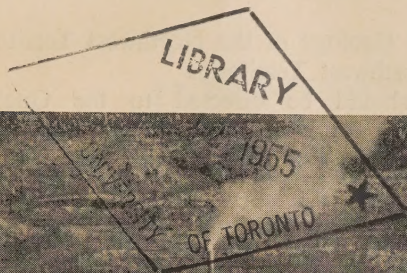
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(CANADA

DEPARTMENT OF RESOURCES AND DEVELOPMENT)

INDUSTRIES OF THE NORTHWEST TERRITORIES



Price 15 cents

This is one in a series of five publications descriptive of the Northwest Territories. The other publications in the series are:

Administration of the Northwest Territories

Transportation and Communications in the Northwest Territories

Flora, Fauna, and Geology of the Northwest Territories

Natives of the Northwest Territories

Requests for copies should be directed to the Queen's Printer,
Ottawa—*Price, 15 cents.*

Cover Picture

The future of the Northwest Territories is completely bound up with the mining industry. At the present time there are three producing gold mines. One of these, Giant Yellowknife mine, was brought into production in 1948 and is now the largest producer in the Territories. An aerial view of Giant is shown on the cover.

CANADA
DEPARTMENT OF RESOURCES AND DEVELOPMENT
NORTHERN ADMINISTRATION AND LANDS BRANCH

**INDUSTRIES
OF THE
NORTHWEST TERRITORIES**

Issued under the authority of
THE HONOURABLE ROBERT H. WINTERS
Minister of Resources and Development

Ottawa, 1953

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INDUSTRIES OF THE NORTHWEST TERRITORIES

INTRODUCTION

INDUSTRIES OF THE NORTHWEST TERRITORIES provides a summary of the natural resources on which the present economy of the Northwest Territories is based, and on which the future expansion of that economy will rest.

From Hudson Bay on the east to the Yukon boundary on the west and far northward from the sixtieth parallel of latitude lies a vast area that has been referred to as a Canadian storehouse of minerals. Already in widely separated spots throughout that area of 1,304,903 square miles, important deposits of various types of minerals have been uncovered. Geological investigations suggest that the surface has only been scratched. It is no exaggeration to say that important mining prospects may develop at any time almost anywhere in that area.

When the need of the world for mineral wealth has become more urgent, and when the problems engendered by distance and climate have been overcome, there is a strong possibility that the Northwest Territories will evolve from a frontier region embracing scattered outposts of civilization into a dynamic, wealth-producing segment of the civilized world.

The economy of the Northwest Territories is not wholly dependent on mineral resources, important though they are. It is, in fact, a surprisingly versatile economy. In addition to minerals, it has two other "export" industries—the fur trade and the inland fisheries at Great Slave Lake.

Down to the present century, the fur trade was the sole wealth-producing industry of the Territories. In value, it averages about \$2,000,000 per year, with wide fluctuations from year to year caused by changing fur prices and cyclic variations in the mammal populations. There is little possibility of any substantial expansion of the industry, which provides a means of livelihood for the native Indians and Eskimos who are, at the present time, undergoing the difficult process of becoming adjusted to the advance of civilization.

The fishing industry at Great Slave Lake is a post-war development that has expanded to the point where it annually exports more than \$2,000,000 worth of fish to the United States market.

In addition to these industries which produce in sufficient volume to export their products to outside markets, there are others which contribute to the self-sufficiency of the Territories. These secondary economic activities include agriculture, lumbering, and the breeding of reindeer on the Arctic Coast. Their markets are solely within the Territories and their future expansion will depend upon the increase in population that would follow the development of one or more of the major industries.

It would be difficult to forecast, with any degree of accuracy, the rate at which the economic development of the Northwest Territories will take place. It is significant, however, that in the two decades between 1931 and 1951, the white population of the Northwest Territories increased by 429 per cent—from 1,011 to 5,344.

It is quite possible, if the hopes of those who are familiar with the Canadian North are fulfilled, that the population will double during the next decade. If so, it is upon the industries outlined in the following pages that the gain will be built.

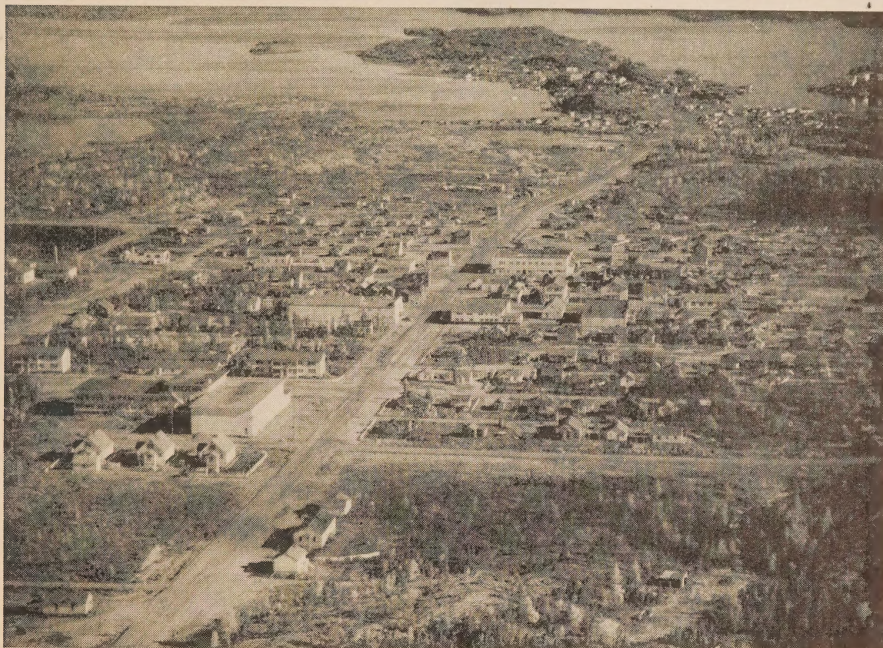
MINERALS

Mineral production in the Northwest Territories is of comparatively recent development. In spite of this, however, the value of mineral output has surpassed that of the fur trade, which had been the only important economic enterprise in the Northwest Territories.

The occurrence of minerals in the Northwest Territories was first reported by Frobisher, who, in 1576, carried out explorations in the Arctic. Frobisher Bay in Southern Baffin Island perpetuates his name. Copper was reported by Samuel Hearne near the mouth of the Coppermine River in 1771 and Alexander Mackenzie, who explored the river system now bearing his name, in 1789, reported the presence of coal seams in the Mackenzie Valley. Most of the present day knowledge of the mineral resources of the Northwest Territories has been acquired since 1920. In that year, and in succeeding years, oil in commercial quantities was discovered in wells drilled on the Mackenzie River about 40 miles north of Fort Norman. There was, however, no local market for the products of these wells and they remained capped for several years.

Renewed interest in the mineral possibilities of the Northwest Territories resulted chiefly from the discovery of pitchblende and silver ores at Great Bear Lake in 1929 and 1930. The spectacular nature of the deposits, which were to have a far-reaching effect, inspired world-wide interest in the region. Later, discoveries of gold in the vicinity of the Yellowknife River on the north shore of Great Slave Lake in 1933 and 1934, strengthened this interest and the mining industry continued to expand in the Northwest Territories until 1942. Conditions created by the war brought production of precious metals almost to a standstill but, in 1944, the extraordinary results of diamond drilling in the Yellowknife area focused the attention of mining men on the gold possibilities of the district. There was a claim staking rush and a resultant demand for building lots in Yellowknife, which had become the hub of mining activity. It became necessary to plan for a larger centre and an area was selected about one mile west of the original settlement. Here a modern townsite was surveyed in 1945 and plans were laid for its development. In 1949, the water and sewerage system to serve the new area was completed. Owing to the extremities of temperature the system was designed for a continuous flow of water, with preheating to prevent freezing in the mains. This system has been in operation for more than two years with satisfactory results.

The greater part of the Mackenzie District of the Northwest Territories has been covered by aerial photography by the Royal Canadian Air Force in co-operation with departments of Government and this program of photography is being continued each year. A library of aerial photographs is maintained in the administrative office at Yellowknife for prospectors' study so that they can determine potential mineralized areas. The Geological Survey of the Department of Mines and Technical Surveys maintains a branch office and resident geologist at Yellowknife. A technical library containing references on mining and geology enables the prospecting and mining fraternity to keep abreast of latest methods and techniques developed in the mining industry. Although the Yellowknife mining district, together with favourable zones south of Great Slave Lake and in



Yellowknife is a modern town set in the midst of the wilderness. As the gold mining industry in the area grew in size, so did Yellowknife, the centre of that industry. The old townsite can be seen in the background, while in fore and centreground is the new townsite.

the Keewatin District, covers an extensive potential mineral area, many localities remain which have not been thoroughly prospected. Geological parties sent out each year by the Department of Mines and Technical Surveys investigate favourable areas. The results of this work are made available to the public and this has been an important aid to the development of mining in the Northwest Territories. This geological recon-

naissance is extending to unexplored and unmapped territory and will, in conjunction with aerial photography, provide the accurate mapping which is essential to detailed mineral exploration.

The following figures released by the Dominion Bureau of Statistics give the value of mineral production in the Northwest Territories since 1947, exclusive of production of radioactive ores:

	1947	1948	1949	1950	1951	*1952	Total Prod'n end '52
\$	\$	\$	\$	\$	\$	\$	\$
Gold	2,188,095	3,556,875	6,389,748	7,635,227	7,819,975	8,438,861	51,233,247
Silver	32,655	19,036	52,350	50,198	60,728	48,925	1,106,528
Copper					536	1,427	26,065
Tungsten						6,786	44,460
Crude Petroleum	500,000	676,574	353,108	352,656	399,887	529,760	4,690,719
Natural Gas ..		15,000	6,523	12,818	7,621	8,000	53,557
	2,720,750	4,267,485	6,801,729	8,050,899	8,288,747	9,033,759	57,154,576

*Preliminary Estimate

Petroleum

Seepages of petroleum in Mackenzie District were known to early explorers, and the first report of the Geological Survey of Canada on the Mackenzie River region, covering field work undertaken in 1887-88, noted signs of its presence. In 1914, three claims were staked along the Mackenzie River near Bosworth Creek, about 48 miles north of Fort Norman. These were later acquired by the Northwest Company, a subsidiary of Imperial Oil Limited, and, in 1919, drilling equipment was shipped to the site, now known as Norman Wells. In 1920, the first well was drilled and oil in commercial quantity was discovered. Three "wild-cat" wells drilled by the Northwest Company and one by the Port Norman Oil Company between 1921 and 1924, within a 45-mile radius of Discovery Well No. 1, failed to produce oil in commercial quantity, but another producer was brought in by the Northwest Company near Discovery Well in 1925.

A small refinery, capable of producing gasoline and diesel fuel, was installed by the Northwest Company in 1921, but there was little demand for these products until mining was commenced at Great Bear Lake in 1933. The development of gold mines in the Yellowknife area greatly increased the demand for petroleum products, and Imperial Oil Limited drilled and brought in two more wells in 1939 and 1940. The productive capacity of the four wells was then about 450 barrels of oil daily. A refinery built in 1939 came into operation in 1940, and its products now include gasoline, light and heavy diesel oils, and fuel oil. In 1943, the capacity of the refinery was increased from 840 to 1,100 barrels of crude petroleum per day.

After the outbreak of war with Japan the production of petroleum products at Norman Wells was increased substantially. The demand for an increase in supplies of petroleum products for the use of the United

States Army in Alaska prompted Canada and the United States to enter into an agreement whereby the latter would undertake a development known as the "Canol Project". Under the terms of the agreement, a drilling program was undertaken to determine the extent and capacity of the oil producing area at Norman Wells. Construction of a pipeline, with a capacity of 3,000 barrels daily, from Norman Wells to Whitehorse, Yukon Territory, and the erection of a refinery at Whitehorse were also carried out under the agreement.

Imperial Oil Limited, which, as the Northwest Company, had been pioneering in the district since 1919, was appointed agent for the United States Government and awarded a contract for drilling and geological exploration. Drilling was commenced in 1942 and continued through 1943 and 1944 into 1945. Construction and testing of the pipeline was completed by the end of March, 1944, and the refinery at Whitehorse was opened in April of the same year. Deliveries of oil by pipeline to the refinery eventually reached a maximum of 4,000 barrels daily. Drilling operations were terminated on March 8, 1945, at the request of the United States Government. The pipeline and the refinery at Whitehorse ceased operations about April 1, 1945, and the contract with Imperial Oil Limited was officially terminated in May, 1945.

During the period, 1942-45, in which the Canol Project operated, 67 new wells were drilled. Of these, 60 found oil in commercial quantity. These wells outlined a field of more than 4,000 acres in extent, with an estimated recoverable reserve of 36,250,000 barrels of petroleum. Prior to 1942, the production of the field totalled 118,895 barrels. Production during the life of the Canol Project was 1,858,447 barrels. The total production to December 31, 1952, from the Norman Wells field was 4,690,719 barrels.

The Canol Project was a military enterprise undertaken for North Pacific defence. When its objective had been achieved, economic considerations forced its abandonment. The closing down of the pipeline shut off the principal market for crude petroleum output of the Norman Wells field, and many of the wells have since been capped or plugged. The mining industry of the Mackenzie District offers a market for the greater part of the petroleum products from the Norman Wells refinery, but consumer markets lie a considerable distance from Norman Wells and the short summer transportation season limits the time during which the product can reach the consumer. The necessary ingredients for the production of high octane gasoline must be brought into the Northwest Territories where mixing plants are operated at suitable locations.

Until recently there has been limited exploration carried out in the Mackenzie District in areas other than at Norman Wells. In 1945-46 exploratory drilling was carried out at Redstone River, a tributary of the Mackenzie 125 miles south of Norman Wells. Formation drilling for geological purposes at Hay River on the western side of Great Slave Lake in 1945, 1946, and 1947 produced inconclusive results.

Interest in the petroleum possibilities in the Mackenzie District has been re-awakened as a result of the success attending oil exploration in Alberta. Permits were granted in 1949-50 to explore for petroleum and natural gas along the Mackenzie River in the vicinity of Fort Providence. Other areas which have attracted attention lie along the south boundary of the Northwest Territories west of Hay River.

Over 30,000,000 acres have been staked for petroleum and natural gas exploration during the past two years and drilling with standard rigs has commenced.



Almost 5,000,000 barrels of oil have flowed from the Norman Wells field since the first well was drilled in 1920. During the Second World War, oil from Norman Wells was important in the North Pacific defence scheme. Today, the chief market is the mining industry of the Mackenzie District.

Radium and Uranium

A visit to the Great Bear Lake region in 1900 by a party of the Geological Survey of Canada, in charge of J. A. Mackintosh Bell, resulted in a report which contained reference to a showing of cobalt bloom and copper green on the eastern shore of McTavish Arm. As the season was late and it was necessary to leave the area before freeze-up no detailed investigation was made. This report remained comparatively unknown for thirty years. In 1929, during the wave of widespread prospecting in northern areas of Canada, Gilbert LaBine visited this area and noted evidence of silver and copper at Echo Bay on Great Bear Lake. The

following year LaBine returned and made the discovery of pitchblende at LaBine Point on Echo Bay which was later to become the famous Port Radium Eldorado Mine.

With the assistance and co-operation of the technical officers of the then Department of Mines an economic process for the extraction of radium was developed. The equipment needed for the mining and concentration of the ore was shipped to the mine site and a refinery for the treatment of the concentrates was built at Port Hope, Ontario. In May, 1933, the first refined radium was produced and shortly afterwards Canada entered world markets.

This new source resulted in a decrease in the high cost of radium and proved helpful to doctors requiring radium for treatment in the field of medicine. Radium became the main product of pitchblende ores with uranium being a by-product.

Since the discovery of fissionable uranium products radium has become the by-product, and Canada holds a pre-eminent position in the production of uranium oxide.

The strategic importance of the Eldorado Mine led the Government of Canada to expropriate the property in 1944, and since that time, the crown-operated company, known as Eldorado Mining and Refining Limited, has expanded mine facilities until now it is one of the four most important producers in the world.

Gold and Other Minerals

Little was known of the mineral possibilities of the Mackenzie District prior to 1897. One of the routes to the Yukon Territory was by way of the Slave River, across Great Slave Lake, down the Mackenzie River to Fort McPherson and thence across the Mackenzie Mountains to the Yukon. This route was taken by a few hardy prospectors who found it necessary to winter at points on Great Slave Lake and the Mackenzie River. During the stopover a lead-zinc deposit near Pine Point on Great Slave Lake was reported. Natives and Hudson's Bay Company employees had attempted to use the surface material to make bullets and this fact became known to the transient prospectors. Gold showings were discovered at this time on Yellowknife Bay but, in all cases, the urgent desire to reach the Yukon led these men to by-pass mineral wealth which was later to become of far greater value than that which they hoped to find at the end of their journey. A geological party of the Department of Mines visited the Yellowknife Bay area in 1933 and in that and the next year claims were staked by visiting prospectors. By 1935 a major rush had developed and properties were located far afield. As a result of the discoveries on Yellowknife Bay the first gold mine in the Northwest Territories went into production in 1938. This property was developed by the Consolidated Mining and Smelting Company Limited. In the following year the company developed the first hydro-electric power at Prosperous Lake about 20 miles from the site of the mine.

The following gold mines are now producing in the Yellowknife area: Con, Giant, and Discovery.

Although the Second World War caused a temporary recession in gold mining in the Territories, 1945 saw much renewed activity.

The Giant-Yellowknife Gold Mine, brought into production in 1948, has become the major gold producing mine in the Yellowknife area.

Other properties are reaching the production stage, and still others in the Mackenzie District are expected to reach the production stage in the next few years.

The presence in the Northwest Territories of other minerals such as lead, zinc, nickel, copper, tungsten, tantalum, columbium, beryllium, lithium, and coal have been known for years. Remoteness of the area and economic factors of production joined to discourage development of the less valuable elements.

Coal is known to occur at several locations on the Mackenzie and has been produced for local consumption in small quantities at the mouth of the river in the vicinity of Aklavik.

Pine Point Concessions

Reference has been made to the presence of lead-zinc deposits at Pine Point on the south shore of Great Slave Lake. The staking of claims in this area first took place in 1920, but the properties remained undeveloped until 1929 when extensive exploration work was carried out by the Northern Lead-Zinc Company. Some half million tons of ore were reported. Nothing more was done until 1946, when the increased price of base metals led to further exploration. In order to encourage expenditure of the substantial sums required, the Federal Government after advertising for tenders granted a concession containing 500 square miles at Pine Point to the companies concerned. The terms of the agreement provided that the companies would spend a certain amount of money for exploration purposes during the term of the agreement. At the expiration of the agreement, the companies would have the right to stake claims, the number to be determined by the amount of money spent. The Pine Point Concession expired on March 23, 1951, at which time 1,099 mineral claims had been staked, with the remainder of the reservation reverting to the Crown and open for independent staking. It seems likely that it will be several years before a decision is reached as to the value of the Pine Point deposits. Proving of claims could lead to important development and possibly to the building of a new community in the North.

District of Keewatin

Because of remoteness and the difficulties of transportation, the District of Keewatin has not received the same attention from prospectors as has been given the District of Mackenzie. The geology of the region is similar to that of the District of Mackenzie and occasional prospecting has revealed the presence of gold and base metals. Some twenty years ago a nickel showing was discovered on Rankin Inlet, Hudson Bay, by Cyril Knight

and, in 1949, leases were taken out for a total of fourteen claims. The Hudson Bay Mining Exploration and Development Company has sent parties of prospectors for many years into the Keewatin District. In 1942 this company staked a considerable number of claims near Henina Lake.

In 1947 and following years, Don Cameron, one of Canada's best known prospectors, extensively explored areas at Ennadai Lake and established the presence of a mineralized belt across the district. The Geological Survey of Canada made a geological reconnaissance of the District of Keewatin during the season of 1952, using helicopters for the first time in this type of survey. Exploration in 1950 by the International Nickel Company resulted in the staking of a number of claims. A concession of 500 square miles was granted this company after advertisement for tenders was made on terms similar to the Pine Point Concession. There are indications that the Keewatin District will receive more attention from responsible mining interests in future years.

Mining Regulations

Miner's Licences: Any person 18 years of age and over, and any joint stock company incorporated or licensed to do business in Canada, is eligible, on payment of the prescribed fee, to obtain a miner's licence. The annual fee for an individual miner's licence is \$5; for companies the fee is according to the schedule as set out in the regulations. Individual licences may be obtained from the mining recorders and sub-mining recorders in the Northwest Territories and at Edmonton, Alberta (C. M. Bolger, agent, Northwest Territories Administration, Macdonald Hotel Annex), or from the mining recorder of the Arctic and Hudson Bay District, Northern Administration and Lands Branch, Department of Resources and Development, Ottawa. Company licences are obtainable only at Ottawa.

Number of claims which may be staked by licensee: Each licensee may, in any one mining district and in any one licence year (April 1-March 31) stake and record six claims for himself and six claims each for two other licensees (proxies), or a total of eighteen claims.

Size of claims: Not to exceed 1,500 feet in length by 1,500 feet in breadth, with boundaries running as nearly as possible north, south, east, and west, and all angles to be as nearly right angles as possible. The total area of the claim should not exceed 51.65 acres. Claims are to be marked on the ground with four legal posts, number one post to be placed at northeast corner. Boundary lines between posts are to be marked out by removal of trees, brush, and obstructions, and by blazing trees on each side of, and adjoining, such boundary lines. Prospectors are urged to exercise care in planting claim posts, and in cutting and marking boundary lines. Each claim post has to be mounded. They are also reminded of the penalties which may be incurred by having staked oversized claims.

Recording: Application for the granting of a claim must be made on the prescribed form to the mining recorder or sub-mining recorder for the district, within fifteen days of staking, if the claim is located within ten miles of the office of the recorder or sub-recorder. An extra day is allowed

for each additional ten miles or fraction of ten miles. The fee for recording a claim is \$5, if recorded on the staker's licence; if recorded on behalf of another licensee, the fee is \$10 a claim.

Grouping: Adjoining claims not exceeding thirty-six in number may be grouped for the purpose of representation work. The fee for a grouping certificate is \$5.

Representation work: Claims may be held for a period of one year and thence from year to year, without the necessity of further recording, provided that representation (assessment) work to the value of \$100 is performed on the claim each year, and the owner renews his miner's licence annually. In general, after work to the value of \$500 including cost of survey of the claim has been performed, and other conditions have been met, application may be made for a lease covering a period of 21 years.

Copies of regulations governing the disposal of the following rights on Federal Crown Lands may be obtained from the mining recorder at Yellowknife, N.W.T., or from the Northern Administration and Lands Branch, Department of Resources and Development, Ottawa, Canada: quartz mining; placer mining; coal; dredging; oil and natural gas; quarrying; sand; stone and gravel.

THE FUR TRADE

Muskrat in total value now leads other kinds of pelts taken annually in the Northwest Territories. Chief among other furs of economic importance are white fox, beaver, mink, ermine, and marten. Fisher, coloured fox, lynx, otter, squirrel, wolf, wolverine, and bear also are taken.

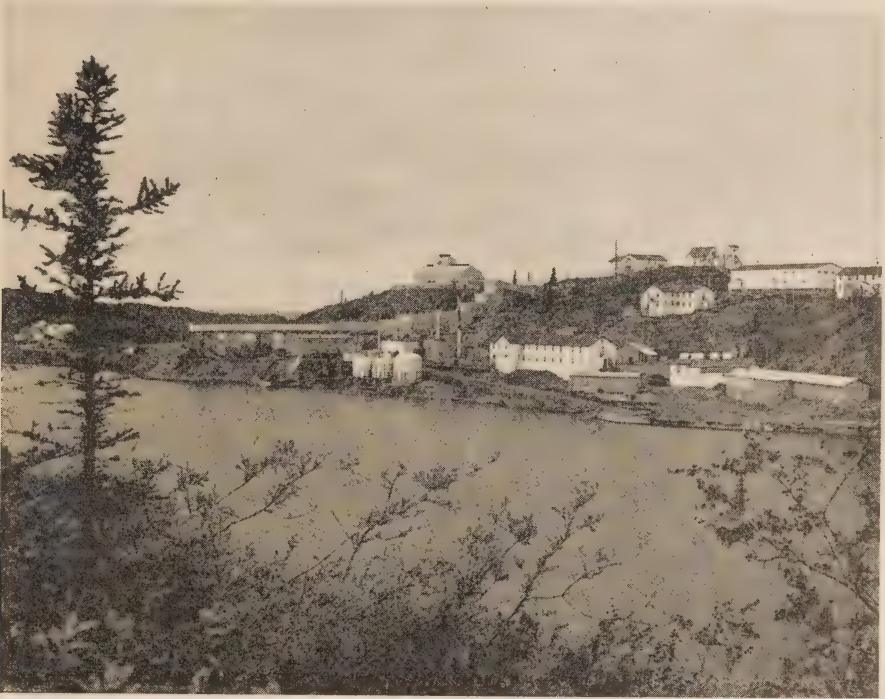
The value of fur production during the past ten years, as determined by the Dominion Bureau of Statistics, is as follows (year ended June 30):

<i>Year</i>	<i>No. of Pelts Taken</i>	<i>Value</i>
1941-42	445,336	\$2,840,701
1942-43	385,440	3,165,107
1943-44	297,633	2,199,132
1944-45	258,931	1,743,710
1945-46	565,065	2,750,183
1946-47	488,039	1,658,754
1947-48	482,420	1,872,302
1948-49	922,136	1,535,461
1949-50	561,400	909,504
1950-51	643,579	2,038,339
1951-52	696,245	1,448,173

The fur trade, in what is now the Northwest Territories, had its beginning in the latter part of the seventeenth century, when Charles II granted the Hudson's Bay Company its charter to trade into those northern regions. From then until 1939, when the value of furs was exceeded by that of minerals, fur trading continued to be the most important industry in the Territories. The trapping of fine furs is still the chief occupation of most of the native population. Trading posts are scattered throughout the Northwest Territories, and the history of that vast region is intimately associated with the fur trade.

Over the past two decades, the fur catch of the Northwest Territories has constituted about $7\frac{1}{2}$ per cent of the value of the Canadian catch. During this period there have been wide fluctuations both in the numbers of the various fur bearers taken and in the prices they have brought on world markets.

The following tables, extracted from annual compilations of the Bureau of Statistics, are given to show the fluctuations which occur among the principal fur bearers.



Port Radium, on the east side of Great Bear Lake and only 30 miles south of the Arctic Circle, was originally developed as a source of radium. In the atomic age, the main interest is now on uranium, and the expansion of facilities in recent years has made Eldorado Mining and Refining one of the four most important producers in the world.

These tables illustrate the total annual take of each group, and such information as they provide of trends and fluctuations among wild creatures is important in planning future conservation measures.

Muskrat—Nature has created an unusually fine habitat for these small fur bearers in the complex of lakes and rivers in the Mackenzie River Delta. Muskrat food is plentiful there, and despite an annual harvest, which in the season of 1950-51 amounted to about half a million pelts, these animals seem to have stood their ground. Over a period of sixteen years

the collection in the Northwest Territories has represented about 12.5 per cent of the entire Canadian muskrat take, and about half of this has been from the delta region.

<i>Year</i>	<i>No. of Pelts Taken</i>	<i>Value</i>	<i>Average Value per Pelt</i>
1941-42	342,775	\$ 675,267	\$1.97
1942-43	276,639	608,606	2.20
1943-44	231,243	434,737	1.88
1944-45	215,612	485,127	2.25
1945-46	448,912	1,234,508	2.75
1946-47	336,662	504,993	1.50
1947-48	395,992	864,782	2.30
1948-49	724,436	869,323	1.20
1949-50	474,182	569,018	1.20
1950-51	494,746	994,439	2.01
1951-52	516,825	573,676	1.11

White Fox—The white fox has been the principal economic resource of the Canadian Arctic and one of the few products which the Eskimo inhabitants could trade for white men's food, clothing, utensils, and other equipment. Over a four-year cycle, there are wide fluctuations in the numbers taken in most localities and in the Northwest Territories as a whole. Fashion changes and the resulting changes in demand also affect prices. This has been particularly noticeable since the end of the war in the steady decline in prices.

<i>Year</i>	<i>No. of Pelts Taken</i>	<i>Value</i>	<i>Average Value per Pelt</i>
1941-42	50,970	\$1,317,575	\$25.85
1942-43	60,521	1,694,588	28.00
1943-44	28,310	912,998	32.25
1944-45	16,765	603,540	36.00
1945-46	20,854	448,361	21.50
1946-47	57,750	779,625	13.50
1947-48	53,227	585,497	11.00
1948-49	31,317	275,590	8.80
1949-50	9,989	64,929	6.50
1950-51	39,739	455,806	11.47
1951-52	49,787	387,841	7.79

Beaver—Experience throughout Canada has shown that without conservation this highly prized fur-bearer, which was the mainstay of the early fur trade, could be quickly exterminated. Successful experiments in suitable areas in various parts of Canada have demonstrated that under careful management beaver populations can be quickly built up to a point where a steady crop can be harvested annually without danger of depletion. Since the autumn of 1945 the trapping of beaver has been restricted and, therefore, the following figures do not necessarily reflect a definite downward trend in population.

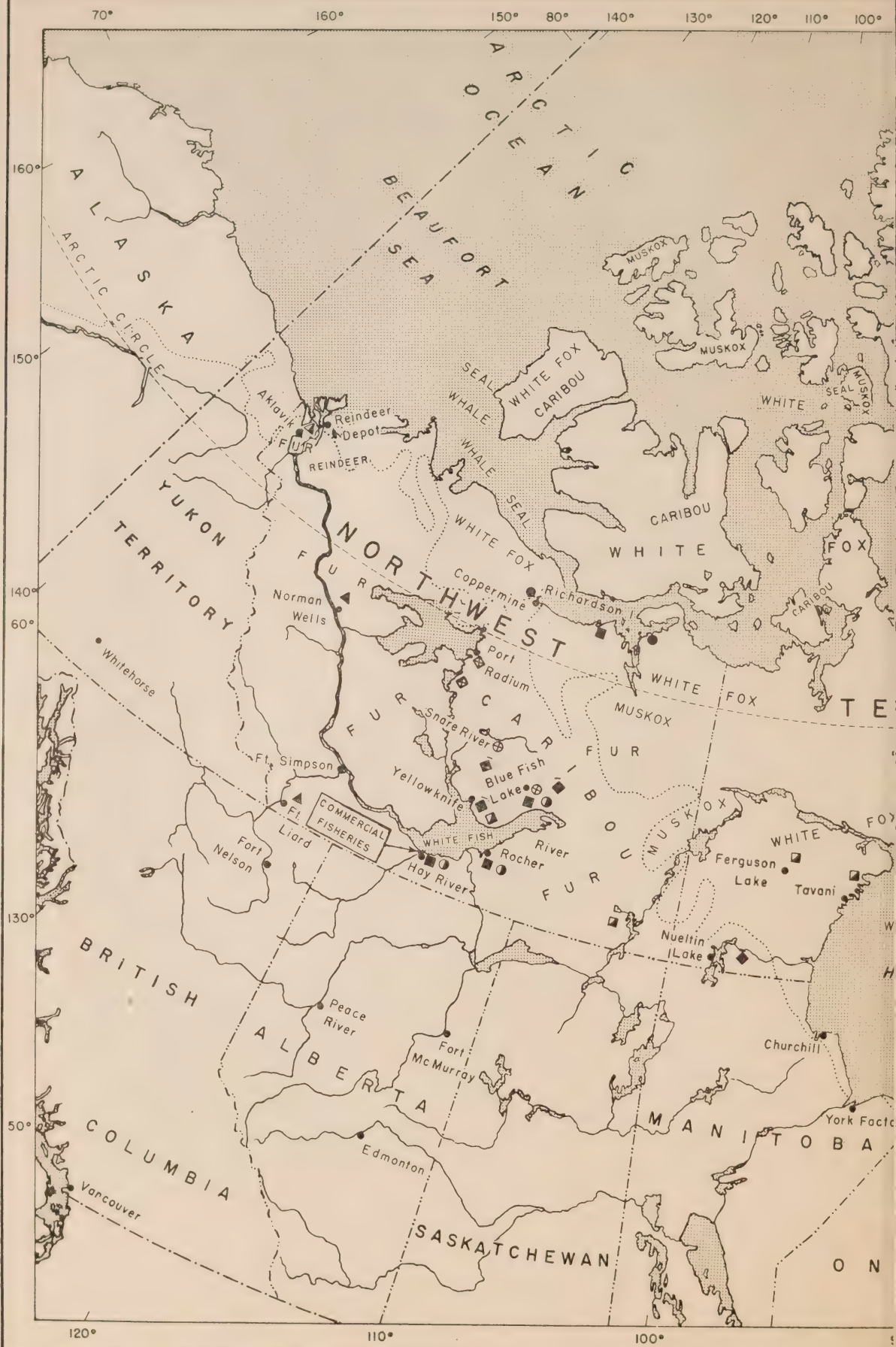
<i>Year</i>	<i>No. of Pelts Taken</i>	<i>Value</i>	<i>Average Value per Pelt</i>
1941-42	14,430	\$373,160	\$25.86
1942-43	11,971	383,072	32.00
1943-44	9,707	332,465	34.25
1944-45	8,426	353,892	42.00
1945-46	12,047	602,350	50.00
1946-47	2,633	84,256	32.00
1947-48	4,290	132,990	31.00
1948-49	6,719	134,380	20.00
1949-50	2,892	62,178	21.50
1950-51	6,610	145,817	22.06
1951-52	12,114	155,180	12.81

Ermine—These animals, usually in poor demand, are not trapped extensively. Those taken are sometimes caught in traps set for other animals. Regional totals fluctuate greatly from year to year, but no study has yet been made to determine the causes of the variations.

<i>Year</i>	<i>No. of Pelts Taken</i>	<i>Value</i>	<i>Average Value per Pelt</i>
1941-42	10,552	\$12,451	\$1.18
1942-43	10,863	11,949	1.10
1943-44	4,821	6,749	1.40
1944-45	3,529	6,529	1.85
1945-46	11,751	26,440	2.25
1946-47	16,709	26,734	1.60
1947-48	16,688	34,210	2.05
1948-49	16,825	21,872	1.30
1949-50	18,891	19,836	1.05
1950-51	12,105	19,126	1.58
1951-52	10,874	13,266	1.22

Mink—Within the last thirty years there have been three mink peaks in the Mackenzie District. The first was recorded in 1923-24 and totals were higher (21,000) than in the next peak of 1932-33 (18,000). The third peak of 1940-41 varied regionally within the district, over a period of three years, and again figures were lower. High prices during recent years have encouraged the trapping of mink and although an increase has been shown in the numbers caught during the past two years, it is evident that the mink population has declined considerably.

<i>Year</i>	<i>No. of Pelts Taken</i>	<i>Value</i>	<i>Average Value per Pelt</i>
1941-42	9,476	\$106,605	\$11.25
1942-43	7,601	91,212	12.00
1943-44	7,778	165,283	21.25
1944-45	4,019	108,513	27.00
1945-46	6,348	209,484	33.00
1946-47	4,200	126,000	30.00
1947-48	3,721	130,235	35.00
1948-49	4,017	112,476	28.00
1949-50	4,215	104,532	24.80
1950-51	6,966	236,287	33.92
1951-52	7,381	184,525	25.00





Marten—In the period 1851-56, the average annual marten collection exceeded 30,000 pelts. Excessive trapping soon decimated this valuable fur-bearer, and this called for a ban on the trapping of marten. In the 1949-50 season the figure had returned to 3,519 with a value of \$62,990. This animal has been so reduced that no cyclic changes are perceptible. The season was closed from 1943 through to 1947 and in the following table pelts shown in those years were accidentally trapped and turned in to the Department.

<i>Year</i>	<i>No. of Pelts Taken</i>	<i>Value</i>	<i>Average Value per Pelt</i>
1941-42	3,219	\$136,743	\$42.48
1942-43	2,766	116,172	42.00
1943-44	163	8,639	53.00
1944-45	420	21,840	52.00
1945-46	1	48	
1946-47	196	8,820	45.00
1947-48	2,172	69,504	32.00
1948-49	2,987	53,766	18.00
1949-50	3,519	62,990	17.90
1950-51	4,542	110,461	24.32
1951-52	4,796	72,180	15.05

Lynx—With the exception of a brief peak in the early forties, the lynx population has declined since the peak of 1934-35. It has been fairly well established that lynx have a ten-year cycle of abundance, which is correlated with the cyclic abundance of rabbits. The season for lynx is closed from February 16 to October 31.

<i>Year</i>	<i>No. of Pelts Taken</i>	<i>Value</i>	<i>Average Value per Pelt</i>
1941-42	1,626	\$ 71,089	\$43.72
1942-43	1,694	79,618	47.00
1943-44	1,803	98,264	54.50
1944-45	1,774	74,508	42.00
1945-46	1,701	59,535	35.00
1946-47	1,065	26,625	25.00
1947-48	1,070	21,400	20.00
1948-49	799	10,387	13.00
1949-50	332	2,822	8.50
1950-51	1,767	16,309	9.23
1951-52	1,637	6,139	3.75

Wolf—Several hundred wolves are taken annually and although their fur value is not usually high, they are killed whenever possible.

Fox—Coloured foxes, including red, silver and cross have in the past represented an appreciable part of the Northwest Territories collection. In recent years, the collections have declined, probably due to a lack of interest in the markets and lower prices. Blue foxes (a colour phase of the white fox) are found in the same Arctic areas as white foxes at a ratio of about one to one hundred.

Conservation and Management

Some years ago, the serious depletion of the wildlife of the Northwest Territories forced the decision to restrict the issue of hunting and trapping licences to British Subjects who, prior to May 3, 1938, had taken up permanent residence in the Northwest Territories and who were dependent upon hunting and trapping for a living. The wildlife resources have not increased everywhere since that time because drought conditions and forest fires have destroyed a considerable part of the forest-cover.

The Northwest Territories Administration has made substantial progress in the establishment of a forest and game protective service, and the problems of wildlife resources management are now under intensive investigation. The native population is also being encouraged to observe conservation practices.

Summary of the Game Regulations

A General Hunting Licence may be issued only to a person over 16 years of age who is

- (1) An Indian, or an Eskimo, who has resided continuously in the Territories since birth, or who is a member of a family or group of Indians or Eskimos that hunted in the Territories prior to July 1, 1949.
- (2) A Canadian citizen who held Northwest Territories hunting and trapping licences on the 3rd of May, 1938, and who has continued to reside in the Territories.
- (3) A child of a holder, or of a person who held a general hunting licence, who continues to reside in the Territories and is dependent on hunting for a livelihood.
- (4) The wife of a man who holds, or at the time of his death held, a certificate of registration for a trapping area.

A child under 16 years of age who assists his parent or guardian in hunting does not require a licence to do so.

The Game Ordinance provides for registration of trapping areas in the Mackenzie District. It is hoped that registration will encourage the trappers to practise conservation of the fur resources in their areas.

Wildlife conditions have deteriorated in some parts of the Territories owing to forest fires and other causes. As a result, the trapping of beaver and marten is restricted.

A licence to shoot game birds may be issued to any person over 16 years of age. The fees are:

- | | |
|--|---------|
| (a) for a Canadian citizen resident in the Territories for at least a year | \$2.00 |
| (b) for any other Canadian citizen | \$5.00 |
| (c) for an alien | \$10.00 |

The Game Ordinance provides that any person may hunt game or take the eggs of non-migratory birds to prevent starvation, but game or eggs so taken must be reported to a game officer.

Copies of the pamphlet *Game Laws of the Northwest Territories* may be had on application to the Director, Northern Administration and Lands Branch, Department of Resources and Development, Ottawa.

Native Game Preserves

Native game preserves have been established in the Northwest Territories to assist in preserving the game resources for the use and benefit of the native population. The right to hunt game in the preserves is limited to Indians and Eskimos. A few white persons, who hunted in the Arctic Islands and Mackenzie Mountains Preserves before they were established, are permitted to continue hunting there under special licence. A list of the preserves follows:

<i>Name</i>	<i>Date Established</i>	<i>Area in Square Miles.</i>
Yellowknife	Sept. 22, 1923	70,000
Slave River	" " "	2,152
Peel River	" " "	3,300
Arctic Islands (land area)	July 19, 1926	772,302
Mackenzie Mountains	May 3, 1938	69,440
James Bay (land area)	July 8, 1948	1,453
		918,647

Other steps have been taken by the Northwest Territories Administration to maintain the fur industry and to preserve species in danger of extinction. The hunting of game is prohibited in the Thelon and Twin Islands Game Sanctuaries. Thelon Game Sanctuary is situated in eastern Mackenzie District and extends into Keewatin District. It has an area of 15,000 square miles and contains the largest herd of musk-ox remaining on the mainland of North America. Twin Islands Game Sanctuary, situated in James Bay, has an area of 55 square miles.

Wood Buffalo National Park, with an area of 17,300 square miles, of which 3,625 square miles are in the Northwest Territories, was established mainly for the preservation of a herd of wood bison or buffalo. When the park was established, the protection and increase, not only of buffalo but of other game species, was intended. Consequently, in keeping with a policy of strict conservation, travellers to the region must obtain permission to enter the park from the District Administrator at Fort Smith. Indian and other persons who hunted game within the area before the park was established are permitted to hunt game under licence. The buffalo are rigidly protected.

Sport Fishing Regulations

Angling in waters of the Northwest Territories by residents and non-residents is permitted by licence, the fee being \$1 for residents and \$2 for non-residents.

Fishing is prohibited each year for the undernoted species of fish as follows:

Lake (salmon) trout or grayling—September 16 to May 15. Minimum size limit for trout or grayling is 12 inches. Catch limit per day is not more than 10 trout of any variety nor more than 20 trout or grayling in the aggregate.

Pike and yellow pikeperch (walleye)—April 1 to May 15. Catch limit daily for yellow pikeperch is 10.

The use of spears, lights, firearms, and dynamite or other explosive material in killing fish is prohibited.

The use of bare, unbaited hooks or grapnels is prohibited.

Provision is made in the fishing regulations whereby explorers, prospectors, surveyors, or travellers, while engaged in exploration, mining, or survey operations, or other examination of the Northwest Territories, may fish at any time without a licence, but with legal implements, for their own domestic use.

Copies of special regulations governing commercial fishing in the Territories may be obtained from the Department of Fisheries, Ottawa.

THE GREAT SLAVE LAKE FISHERIES

The commercial fisheries of the Northwest Territories are centred at Great Slave Lake. The industry had its start in 1945 and its development has been rapid and profitable.

Great Slave, with an area of 11,400 square miles, is the fifth largest lake on the continent and lies 340 miles south of the Arctic Circle. Whitefish and lake trout, caught there both in summer and winter, have an annual marketed value of more than \$2,000,000.

Responsibility for the development and administration of the commercial fisheries of the Northwest Territories lies with the Federal Department of Fisheries. The Department's field administration is carried out through the office of the Chief Supervisor of Fisheries for the Central Area, with headquarters at Winnipeg, Manitoba.

From a commercial fishery point of view, Great Slave Lake was in a virgin condition in 1944, when the Fisheries Research Board of Canada made the first scientific survey. As a result of this survey the lake was opened to fishermen in 1945. Catch limits and fishing regulations for whitefish and lake trout were established, based on the Board's recommendations. Because of complete Federal jurisdiction in the Northwest Territories, Great Slave Lake provided an outstanding opportunity for a program of fishery management, founded on research and scientifically applied conservation measures. It is the first, if not the only, fishery which has been opened commercially following scientific investigations.

These investigations are being continued by the Research Board, and its findings enable the Department to formulate regulations and set catch limits based on sound biological information. Catch limits for whitefish and trout have been increased from the original two million pounds per annum to the present nine million-pound quota.

At the opening of commercial fishing in the summer of 1945 there were 42 fishermen on the lake. During the winter season of 1951-52, 305 licences were issued, resident and non-resident, and more than three million pounds of fish were taken by the fishermen, who operated in temperatures as low as 65 degrees below zero. The catch during the 1952 season was 7,200,000 pounds of whitefish, trout, and inconnu.

The opening of the highway from Grimshaw, Alberta, to Hay River on Great Slave Lake was an important factor in the success of the fishery. This road became an all-weather highway in the autumn of 1948, and allows quick and economical transportation of fish to the railhead at Grimshaw.

The Department of Fisheries has implemented regulations to make sure that commercial fishermen operate with adequate equipment so that the fish can be kept in prime condition after being caught. The Department maintains a system of product inspection at Hay River and at Gros Cap, the two points on the lake where fish packing houses are located.

The principal market for Great Slave Lake fish is the United States, which takes about 90 per cent of the production. In January of 1952, a 3,200-mile fish haul by refrigerated truck, believed to have established a long-distance record, was made from Hay River to New York City. The trip was carried out as an experiment. The shipment left Hay River in the late evening of January 3 and arrived in New York in the evening of January 8. The fish was unloaded and sold by eight o'clock the next morning. Since then truck loads of fresh Great Slave Lake fish have been sent from Hay River to Chicago.

The Department has established a senior fishery inspector and a number of guardians at Hay River, and maintains two patrol vessels on the lake for use in the summer fishing season. For winter work it has snowmobiles. Altogether, more than 40 snowmobiles are in use at Great Slave each winter by fish companies and various Government agencies. An indication of the success of the fishery is seen in the fact that one fishing company has built a 56-foot diesel powered freighter for use on the lake, designed to carry as much as 36,000 pounds of fresh fish, with adequate refrigeration.

WATER POWER

The growing mining industry in the Northwest Territories, particularly in the Yellowknife area, has, in recent years, promoted strong interest in water-power resources. With the exception of oil produced at Norman Wells on the Mackenzie River, the Northwest Territories lack fuel in volume useful for power.

The water resources of this great region are limited when compared with those existing in some other parts of Canada. This is attributable, in part, to the low rate of precipitation, estimated to average about 12 inches per annum. Much of this falls during the summer months. In the long winter period, surface run-off stops entirely and, except where natural or artificial lake storage is available, river flows fall to meagre amounts by late spring. Topographical conditions favourable to power development exist only in limited parts. Aerial photographic surveys and mapping and geological explorations have increased the amount and reliability of the information concerning the topography of the region. Many important rivers and lakes have been mapped and reasonably accurate estimates have been made of the available natural heads at important sites.

A beginning has been made also on the more precise power surveys which are necessary before development of a water-power site can be undertaken. Power surveys were made by the Dominion Water and Power Bureau (now Water Resources Division, Department of Resources and Development) of the Yellowknife and Beaulieu Rivers in 1937, and of the Snare and Lockhart Rivers in 1945 and 1947. A number of permanent gauging stations were established to record stream flows systematically.



Many potential water power sites in the Northwest Territories have still to be developed. This picture shows one of these sites, Alexandra Falls on the Hay River.

Reconnaissance investigations of certain sites on other rivers have also been made in recent years by private organizations. There are, however, vast areas tributary to Hudson Bay and the Arctic Ocean about which information is limited to that reported by the few travellers who have passed through.

The Great Slave Lake basin with its numerous streams contains the larger part of the known water-power resources of the Territories. North of the lake, a great plateau rises sharply to an elevation of about 1,000 feet. This plateau, part of the Canadian Precambrian Shield, contains numerous lakes, large and small, connected by short reaches of river frequently broken by falls and rapids which in many instances offer power sites with good storage. On rivers flowing into Great Slave Lake from the south, the gradient is more gradual, storage lakes are few, and favourable sites for dams are infrequent.

The Mackenzie River is a deep-water, navigable stream from the outlet of Great Slave Lake to its mouth in the Beaufort Sea. Its western tributaries, flowing from the Mackenzie Mountains, have steep gradients, offering possibilities for power development; there is, however, only scant lake-storage available to supplement meagre winter flows. From the east there is little drainage, the Great Bear River being the principal tributary.

Potential power resources in the Northwest Territories are estimated at about 800,000 h.p. under conditions of ordinary six months flow. This figure would be reduced to about 373,000 h.p. at ordinary minimum flow. These estimates, which are not final, represent only the minimum power possibilities. They cover only the more important rivers and those sites where some more or less definite information has been secured.

One of the more attractive rivers, as far as power is concerned, is the Lockhart, which discharges into the eastern end of Great Slave Lake. Reconnaissance surveys were made there in 1945 and 1947. This river has a fall of 660 feet in the 20-mile reach between Artillery and Great Slave Lakes, and this stretch alone has a potential capacity of 125,000 h.p. Other small sites are available on the upper reaches. The Snare River, flowing into the western end of Great Slave Lake, has a total capacity of about 40,000 h.p. in a number of sites. Smaller power possibilities exist on the Yellowknife and other rivers flowing in from the north.

The rivers flowing into Great Slave Lake from the south are less favoured with lake storage reservoirs, and winter run-off is low. The Taltson-Tazin Rivers system has many rapids and falls. The Twin Gorge Falls on the Taltson, with a natural fall of 90 feet and a reported feasible developed head of 120 feet, is particularly notable. The power resources of this river are estimated at about 200,000 h.p. A portion of the flow of the upper Tazin was diverted south into Lake Athabasca for a power development near Goldfields, Saskatchewan, but this is not being operated at present. There are also smaller power possibilities on the Hay, Snowdrift, and Kakisa Rivers, totalling perhaps 50,000 h.p. at ordinary six months flow.

Where it cuts through the Franklin Mountains, the Great Bear River has rapids which afford a power head of about 25 feet. The vast area of Great Bear Lake is available to equalize the flow and allow production of roughly 30,000 h.p. of firm power. Tributary to Great Bear Lake is the Camsell River on which, at White Eagle Falls, a head of 70 feet can be realized. This would produce 4,000 h.p. at estimated minimum flow and in excess of 6,000 h.p. with regulation on the series of lakes immediately upstream.

The western tributaries of the Mackenzie River below Great Slave Lake are mountainous streams, with steep gradients offering numerous power sites. Little storage is available to supplement low winter flow. At Virginia Falls on the South Nahanni River there is a descent of over 300 feet having a power capacity estimated at 6,000 to 12,500 h.p. Other possible sites are believed to exist on the Liard and Peel Rivers.

Some of the rivers flowing into the Arctic Ocean, including Coppermine and Back Rivers, appear to have considerable power possibilities. This is true also of rivers flowing into Hudson Bay. It is thought that 18,500 h.p., under a head of 80 feet, might be developed at Bloody Falls on the Coppermine. The Dubawnt River appears to have a power capacity of over 200,000 h.p. covering eight listed sites.

At the southern edge of the Northwest Territories, on the Slave River above Fort Smith, where there is a drop of 110 feet in 18 miles, it is believed that from 220,000 to 506,000 h.p. could be developed at two concentrations. Most of this power is in Alberta.

Two power developments have been completed to date in the Northwest Territories—4,700 h.p. on the Yellowknife River by the Consolidated Mining and Smelting Company of Canada Limited in 1940 and 8,350 h.p. on Snare River by the Government of Canada in 1948.

The Yellowknife development consists of a dam at the outlet of Bluefish Lake, which raises the water 15 feet, and a power-house near Prosperous Lake to which the water is diverted from the upper lake about one-half mile across the divide by means of an open cut, a rock tunnel, and a woodstave penstock. The power equipment consists of a turbine rated at 4,700 h.p. and a generator of 4,200 kilovolt-ampere capacity. Delivery of power from this source was commenced on January 15, 1941 over the 33,000-volt transmission line to the Con and Negus mines. Power from the project is utilized for distribution in the Yellowknife Settlement.

Reconnaissance surveys of the Snare, Emile, Marion, and Lockhart Rivers were made in 1945, and, early in 1946, construction began on the Snare River of a power development intended to meet the needs of the district. The development consists essentially of a storage and power dam located some two miles below the original outlet of the Snare River from Bigspruce Lake, 90 miles by air northwest of Yellowknife. The dam is 83 feet high, 785 feet long, and is constructed of earth and rock fill with a clay core. It provides a storage area of some 30 square miles. The maximum head is 64 feet and the turbine is rated at 8,350 h.p. Power is transmitted at 115,000 volts over a 90-mile line to the terminal sub-station near the Giant Yellowknife Gold Mines Limited mill, about three and one-half miles north of Yellowknife, and is distributed to mines and other consumers in the area. The plant is being operated by the Northwest Territories Power Commission which was established in 1948 by the Federal Government.

AGRICULTURE

Since the early days of exploration and settlement small scale farming operations have been carried on in the valleys of the Mackenzie River and some of its tributaries. By 1826, gardens were kept at all Hudson's Bay Company posts as far north as Fort Good Hope. Most of this pioneer work in agriculture was undertaken by fur traders and missionaries. These pioneers were not deterred by the short period of growth, drought, or other hazards that threaten the gardeners and farmers of the North.

Garden trials, made by the Oblate missionaries and others for the Department of Agriculture between 1911 and 1940, produced useful facts about those vegetables which are most adaptable to the climate and soil conditions along the Mackenzie River system. These trials showed that, with proper care, good crops of selected vegetables could be grown in most years. This is true, however, only of the great valleys of the Mackenzie. Elsewhere in the Territories, and in the Eastern Arctic particularly, the soil, topographical conditions, and the climate unite to suppress plant life and thwart agriculture. In most Arctic settlements small gardens are grown in greenhouses and in the windows of dwellings where, when the Eastern Arctic Patrol makes its annual call, residents proudly display their vigorous crops of tomatoes, lettuce, or green peas, each single vegetable having been nurtured with an energy that could produce a field of wheat in a more temperate climate.

An intensive program of investigation into the agricultural possibilities of the Territories was opened in 1943, when a committee of representatives from the Department of Mines and Resources and the Department of Agriculture was formed to encourage agriculture in the Territories and also in the Yukon. Soil and horticultural surveys were undertaken in the Mackenzie District in 1944 and 1945. These led to the establishment of an experimental substation at Fort Simpson and a small substation for vegetable trials at Yellowknife. The Fort Simpson station is the headquarters for Government research in the Mackenzie District and the officer in charge is responsible for experimental work in crops at Yellowknife and Fort Simpson. Apart from this he carries on joint trials with interested growers elsewhere in the region. Reports of the exploration surveys conducted along the Mackenzie River system show that many thousands of acres of good alluvial soils lie adjacent to the Liard, Slave, and upper Mackenzie Rivers. These soils are, for the most part heavily wooded, but they offer the best possibilities for agricultural development both in point of value and climate. Even where only poor soils exist, if the climate allows, vegetable crops may be raised successfully by using plant food. At Yellowknife, good gardens and lawns are being grown both on peat and sand, with the use of heavy dressings of commercial fertilizers and by irrigation.

North of Fort Simpson possible agricultural land seems limited to the bottom and bench lands immediately along the rivers. There, the acreage is considerable but scattered. A characteristic feature of the soils of this region is the presence of permanently frozen subsoils. These do not seem to affect crop growth adversely and may even serve a good purpose by holding moisture in the soil.

Much information is still needed on varieties of crops best adapted to the North and their production. The continuing investigations of the experimental substation at Fort Simpson and also those of interested growers should bring this knowledge to light.

Agriculture is carried on in a limited manner at the present time in the Northwest Territories and observers are in agreement that before any part is opened for agricultural settlement, all conditions must be carefully studied. Problems of transportation and markets as well as those of production must be solved before any thriving agricultural settlement is possible. On the other hand, an expansion of gardening, and even of small scale farming in places, would be well worth while along the Mackenzie River system.



Although the season is short, gardeners in the Northwest Territories take advantage of the long hours of summer sunshine to produce good crops. Here two sturdy children sample carrots grown in the Oblate Mission garden at Fort Good Hope.

REINDEER INDUSTRY

The reindeer industry in Canada was started in March, 1935, with a herd of 2,370 animals trekked from Alaska for the express purpose of giving the native peoples of the far north a new source of livelihood.

During the years following the reindeer adapted themselves to their surroundings and have more than tripled in number. The annual roundup

of 1952 tallied 7,614 animals, free from any serious disease. More than this number of reindeer have been utilized for meat and skins. This represents the achievement of sixteen years.

In 1922, a report was made by a Royal Commission which had been set up to study the possibilities of raising reindeer and musk-oxen. The Commission made recommendations that led, in 1929, to the purchase of a herd of reindeer from Alaska after much investigation to find the best range for the experiment.

Arrangements were made with an Alaskan reindeer company to deliver a herd of 3,000 reindeer to a range near the mouth of the Mackenzie River. The drive from Alaska began in December 1929. A. E. Porsild assisted in the selection of the reindeer for this purpose. The drive was in charge of the late Andrew Bahr, veteran Lapp reindeer herder, who was assisted by other Lapps and several Eskimos. Many difficulties were encountered and many problems arose pertaining to communication and supply in crossing the mountains of northern Alaska and the bleak coastal plain to the Mackenzie Delta. Some of the reindeer broke away and returned to their home range. Blizzards, intense cold, straying, accidents, and the depredations of wolves delayed progress. Heavy losses to the herd were sustained but were recouped to a large extent by the fawn crop each year. The reindeer arrived in Canadian territory in 1933, but completion of the trek was delayed by the unusual difficulties of moving the herd to the east side of the Mackenzie Delta. A herd of 2,370 animals was finally delivered on March 6, 1935.

Preparations for the reception of the reindeer were made at Kittigazuit on the Arctic Coast and there a corral was built. In 1931, three Laplanders and their families were brought from Norway to train the Canadian Eskimos in the handling of herds. In 1933, the Reindeer Protection Ordinance was enacted and an area of 6,600 square miles on the east side of the Mackenzie Delta was reserved. Buildings were erected for the station staff and equipment. In 1952, the reserve was enlarged to 17,900 square miles.

The reindeer staff now has a nucleus of Canadians and Laplanders. Young Eskimos are employed as apprentice herders. More than 100 Eskimos have had experience in the industry; some have remained fairly constantly on the job and have become good herders but most of the nomadic peoples of the Far North prefer to hunt and trap for a living. They do not enjoy a life of set routine.

The training of the more interested young Eskimos includes checking and counting at the summer roundups, the transfer of herds to essential ranges, the slaughter of animals, and the handling of meat and skins. They also are given instructions on predators, insect pests, and day-by-day herd control.

Reindeer are supplied to trained Eskimos, and help is given in setting up herding units in places apart from the main herd. When the new herd

increases in size under protection, some animals are to be turned over to the Administration and the remainder become the property of the herd managers. By the middle of 1952, three such herds were under Eskimo management.

Experience has shown that reindeer herds cannot be successfully maintained without protection. Losses caused by predators and straying become serious when herds are not guarded.

The superintendent of the station supervises the field work, directs his crew, and maintains the buildings and equipment. Qualified observers visit the station periodically and scientists make their reports. The reindeer have adapted themselves to conditions of life in Canada and no effort has been spared by the Administration to make this possible. It rests with the Eskimo people whether or not they take advantage of the opportunity which has been offered them. Efforts are being made to explain what it may mean to them as a source of income in the days to come.

The extent to which reindeer herding may be developed as an industry for the native peoples depends upon how many of them are willing to accept the herder's way of life. There is evidence that reduced prices of fine fur has led enterprising young Eskimos to become herders.

There is no enterprise in Canada comparable to reindeer herding. This plan to introduce a stable ranching industry among a race of nomads is indeed experimental but it is an important facet of the whole effort to safeguard the Eskimo population. The results are being carefully watched.

ESKIMO HANDICRAFTS

Before the white man entered the Canadian Arctic in any appreciable numbers, the Eskimo people were economically self-sufficient. Over the centuries they had managed to adapt themselves to the meagre resources of the north and maintained an adequate, if low, standard of living.

With the coming of the white man on a permanent basis, the way of life of the Eskimo people gradually began to change. They acquired, and became dependent upon, the white man's goods, which they obtained in exchange for the pelts of the arctic fox. So long as foxes were abundant and the price for their pelts was reasonably good, the Eskimo could prosper. Unfortunately, however, the price of fox fur fluctuated, the fox population varied from season to season, and moreover, the price of manufactured goods varied considerably.

It soon became evident that the Eskimo people were becoming heir to the defects of a "one-crop economy" and that, for their well-being, a greater variety of means of livelihood was required.

One of the most evident ways of securing this variety lay in the field of handicrafts. The Eskimo people had always made for themselves such articles as bowls, and knives, and, for the amusement of their children, had carved dolls and kayaks. Whenever these articles were taken outside the Arctic, they found a ready market. Here, then, was an opportunity of broadening the Eskimo economy.

In the summer of 1949, the Canadian Handicrafts Guild made a test purchase of Eskimo hand work on the east coast of Hudson Bay in the area of Port Harrison and Povungnituk. Many interesting handicraft items were collected and sold successfully in Montreal. The Department of Resources and Development, meanwhile, was interested in the work of the Guild in the Northwest Territories and was, in particular, interested in finding additional sources of income for the Eskimos.

Assisted by a grant from the Department, the Guild sent an officer into the field a second time. His assignment was to encourage the Eskimos to develop their own characteristic handiwork. He visited the Port Harrison, Povungnituk, and Cape Smith areas during the early part of 1950, and, while working among the people, bought 2,500 pieces.

In the summer of 1951 welfare teachers of the Department of Resources and Development at Coppermine, Aklavik, and Tuktoyaktuk were making collections which they hoped to enter in the Eskimo handicraft display given by the Guild at the Canadian National Exhibition in Toronto. Work of the Eastern Arctic people was being studied in the West by means of visual aids.

At Ottawa, Northern Administration, in conjunction with the National Film Board and the Canadian Handicrafts Guild, was preparing a film strip on handicraft which would be shown in Eskimo settlements to awaken the interest of the people in the production of more articles of salable standard.

In the winter of 1950-51, the Guild again sent an officer into the Eastern Arctic. Instruction was given to Eskimos at Frobisher Bay, Lake Harbour, and Cape Dorset. During the Eastern Arctic Patrol, collections were exhibited to Eskimos in the more northerly regions of Baffin Island. The exhibit aroused much interest there, as it was to do later in Montreal and Toronto. As a result encouragement of the Eskimos in their handicrafts is being continued.

LUMBERING

The tree line (the northernmost limit of tree growth) extends in the Northwest Territories from the mouth of the Mackenzie River southeasterly to a point near Churchill, Manitoba. Thus, the eastern portion of the Territories is almost devoid of forests, while in the Mackenzie District there are several areas of forested land, varying in nature from scattered clumps of stunted conifers and birches near the northern limit of tree growth to fairly heavy stands of poplar and spruce in the river valleys in the southern part of the district.

The principal tree species in the forests of the Northwest Territories are aspen and balsam poplar, white and black spruce, white birch, tamarack, and jack pine. The Mackenzie lowlands section is the most important forest area. It occupies the low lying plains in the basin of the Mackenzie River and embraces the lower portion of the Liard, Peel, and Great Bear Rivers. White spruce, poplars, and birch are well represented. Black spruce and tamarack occupy the swamps, and jack pine is found in the sandy areas.

Considerable progress has been made by the Forestry Branch of the Department of Resources and Development in studies of the forest cover of the Territories. These studies have been made by field inventory surveys and through the interpretation of aerial photographs. The results indicate that there are two billion board feet of standing white spruce on alluvial flats and delta lands of the Peace River in Wood Buffalo National Park (part of which is in Alberta and part in the Northwest Territories). Also there are 85 million board feet of white spruce on the Slave River between Fort Smith and Fort Resolution. On the Mackenzie River, between Great Slave Lake and Norman Wells, there are another 206 million board feet of white spruce.

The timber resources of the Northwest Territories are significant in that they supply local needs and thus eliminate the necessity of importing lumber, the cost of which would be very great.

Small sawmills, usually equipped with planing machines, are in operation at various points on the Slave River, Great Bear Lake, and the Mackenzie River. Most of the lumber sawn is white spruce, which is used in construction and boat building. The development of the mining industry in recent years has created demands for mining timber, which is mostly sawn from stands along the Slave River between Fort Smith and Great Slave Lake.

Although lumber is the chief wood product commercially, there are numerous other specific uses for wood. For example, because of its toughness and durability, the limited supplies of tamarack are invaluable for use in certain parts of boats. The natives use white birch for snowshoe frames and the frames of canoes, although the use of birch bark in canoe-making has been outmoded by canvas. Black spruce, occasionally sawn in small quantities, is used chiefly in the construction of log cabins in conjunction with jack pine.

At the present time, the major user of wood is the mining industry, located chiefly in the Yellowknife area and on the south shore of Great Slave Lake, and the oil fields at Norman Wells.

Forest Protection

More extensive habitation has probably increased the incidence of forest fires during recent years. This increase has a direct effect on all forest values, including game and fur-bearing animals, so important for the support of the native population. Fires have destroyed many valuable forested areas that formerly constituted the better type of wildlife habitat in the Mackenzie District. The decline in the fur yield in recent years can be attributed in part to the destruction by fire of the natural cover of fur-bearers.

In 1949 fire destroyed 129,232 acres of which 1,170 contained merchantable timber; in 1950, fire destroyed 714,000 acres of which 2,500 had been merchantable timber; in 1951 there were 88,614 acres burned with a loss of 1,040 merchantable acres. The non-forested area burned over in 1949 was 128,062 acres in extent; in 1950 it was 369,000 acres, and in 1951, it was 85,720. There were 88 fires in 1951. Of these 49 were caused by lightning and 25 by campfires.

A Forest and Wildlife Management Service has been established by the Federal Government to deal with matters relating to the conservation of forest resources. The Superintendent of Forest and Wildlife Management, who is resident at Fort Smith, is assisted by a staff consisting of a forest engineer, a technical officer, and a number of park wardens and patrolmen. In the Mackenzie River Valley, wardens occupy well-equipped stations at Fort Smith, Yellowknife, Hay River, Fort Liard, Fort Resolution, Fort Simpson, Fort Norman, Fort Good Hope, Fort McPherson, and Aklavik; there are also two wardens and a number of patrolmen in Wood Buffalo Park. These field officers are employed during the fire-hazard season on forest fire prevention and suppression duties. The wardens are trained fire-fighters and act as fire bosses and supervisors during the forest fire suppression operation. Fire-fighters are employed locally to assist the wardens.

Large outboard powered canoes, skiffs, and inboard motor boats are maintained at strategically located wardens' posts along the Slave River, Slave Lake and the Mackenzie River for the transportation of fire suppression crews and their equipment. The Department has under contract during the fire-hazard season, two standby aircraft for forest fire reconnaissance and the transportation of suppression crews. Additional aircraft can be chartered at Yellowknife when required.

During 1951, six motor patrol boats of the Forest Protection Service logged more than 2,000 hours while patrolling some 30,000 miles of lakes and rivers. The warden staff also carries out patrols by aircraft, canoe, truck, passenger car, and on foot.

Fire prevention publicity plays an important part in protection work each year. Warnings are printed in newspapers and given by radio. Forest fire prevention signs are placed in prominent locations along roads and trails, at the beginning and end of portages, and in camping grounds along the common routes of travel. Literature on the care and use of fire is given to children, and instructions on fire prevention form part of their natural science and social studies. When possible, fire wardens give talks to children in their own districts.

Disposal of Timber

The Department of Resources and Development administers timber on Territorial lands in the Northwest Territories. Agents of the Department are located in the main settlements where applications to cut timber and information on the methods of operation may be obtained. Timber permits of two distinct types are issued, for the cutting of fuelwood and lumber in small quantities for domestic use and for commercial operations where timber is cut in quantity for sale.

Copies of the Regulations pertaining to lands and timber may be obtained from the agents in the field offices.

GENERAL INFORMATION

Employment

The mining industry and, to a lesser degree, associated developments, offer most of the opportunities for employment in the Northwest Territories. A national employment office has been established at Yellowknife by the Department of Labour, and its manager is actively in touch with those able to offer employment in the district. The National Employment Service at Edmonton, Alberta, possesses reliable information about conditions in the Mackenzie District. To work in the mining industry a man must be in good physical condition and he is required to undergo a medical examination before he is employed.

Business

There are limited opportunities for commercial enterprises in the Territories, and, in districts such as Yellowknife, opportunities correspond with expansion of the mining industry. Those planning to enter business at Yellowknife, or other settlements, are urged to visit the proposed site and canvass the situation beforehand. Lumber and building materials are still in short supply, and transportation costs are high.

Supplies and **C**ommodities

Most foodstuffs, other than fresh fruit and vegetables, are imported during the summer months when lower freight rates are offered by water transportation. Unexpected growth in population affects supplies, which, in the event of shortage, must be replenished in the western communities of the Territories by use of trucks, tractor train, or aircraft at increased cost. The cost of living at settlements in the Northwest Territories is much higher than in the provinces, largely on account of transportation costs.

Fresh vegetables are grown and may be purchased at many of the settlements in the Mackenzie District during the summer months. In Franklin District and the Eastern Arctic white residents and missionaries sometimes maintain small greenhouses in which they grow delicacies such as radishes or tomatoes. Practically all dairy products, however, are imported, and condensed or evaporated milk is used almost exclusively. Some eggs and fresh milk from a local dairy farm are produced and sold at Yellowknife and other points along the Mackenzie River system.

Both wood and oil are used for fuel, although oil is gradually replacing wood in some of the larger settlements. The numerous coal deposits of the Arctic Islands have been tapped both by early explorers and by modern residents in the outposts near to them. For example, lignite coal at Salmon River has been mined in small amounts since 1924, and supplies welcome fuel to the settlements. Small amounts of coal are also mined along the west side of Darnley Bay for the use of missionaries at Paulatuk.

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